

RESEARCH NEWS FOR U
(RNFU)
A coffee table magazine
2011, 1 (1)

Prebiotics

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Prebiotics are non-digestible food ingredients that stimulate the growth and/or activity of bacteria in the digestive system in ways claimed to be beneficial to health. They were first identified and named by **Marcel Roberfroid** in 1995. As a functional food component, prebiotics, like probiotics, are conceptually intermediate between foods and drugs. Depending on the jurisdiction, they typically receive an intermediate level of regulatory scrutiny, in particular of the health claims made concerning them.

Typically, prebiotics are carbohydrates (such as oligosaccharides), but the definition may include non-carbohydrates. The most prevalent forms of prebiotics are nutritionally classed as soluble fiber. To some extent, many forms of dietary fiber exhibit some level of prebiotic effect.

Prebiotics can be defined as “nondigestible food ingredients that beneficially affect the host by selectively stimulating the growth of one or a limited number of bacterial species in the colon, such as Bifidobacteria and Lactobacilli, which have the potential to improve host health.” Prebiotics are, simply speaking, the “food” for beneficial bacteria.

Sources

The prebiotics are generally found in foods we eat. It can also be incorporated into foods.

Table 1: Components of prebiotics with their sources:

Component	Source	Potential Benefit
Prebiotics from foods:- Inulin, Fructo-oligosaccharides (FOS), Polydextrose, Arabinogalactan, Polyols—lactulose, lactitol, Xylo-oligosaccharides, Transgalacto-oligosaccharides, etc.	Whole grains, Onions, Bananas, Garlic, Honey, Leeks, Artichokes, Fortified foods and beverages, Dietary supplements and other food applications	1- Improve gastrointestinal health; 2- Improve calcium absorption

Mechanism of action:

Prebiotics acts by following mechanisms:

1. Increases the amount of lactic acid producing bacteria e.g. Inulin & Oligofructose.
2. Increases the amount of Short Chain Fatty Acids (SCFAs).
3. Activates carbohydrate receptor immune

cells.

4. Increase absorption of vitamins and minerals (calcium & magnesium).

Table 2: Prebiotics incorporated into foods:

Food Products	Source	Potential Benefit
1. Nutren Fibre® (powder) 2. Bioplus prebiotic cap/chewable tab. 3. Sun Fiber (powder)	1.Nestle 2.Kendy Nutraceuticals, USA 3.Taiyo Lucid Pvt. Ltd.(TLPL)/ Japan	1. Diarrhea & constipation, malnutrition, lactose intolerance. 2. Improve GIT function, modulation of gut microflora. 3. Boost immune system

Health Benefits of Prebiotics:

1. Improve bowel function,
2. Increase stool frequency,
3. Increase stool weight,
4. Increase production of short-chain fatty acids,
5. Promote the growth of the health promoting bacteria Lactobacilli and Bifidobacteria,
6. Restore gut microflora during or after antibiotic therapy,
7. Inulin can reduce insulin concentrations and lowered triglyceride levels.

Indications:

1. Therapeutically useful in Irritable Bowel Syndrome (IBS) and colorectal diseases.
2. Prevention of Antibiotic Associated Diarrhea and the treatment of Clostridium difficile Disease.

Contraindications:

Prebiotics like Lactulose is contraindicated in those who require low galactose diet.

Potential Adverse Effects of Prebiotics:

GI Disturbances: Constipation/ Abdominal pain/ Flatulence/ Bloating

Conclusion:

The primary role of a diet is not only to provide enough nutrients to fulfill metabolic requirements of the body but also to modulate various functions of the body. The prebiotics facilitate the growth of the beneficial gut microflora, which can be suitably harnessed by the food manufacturers and hold considerable promise for health care industry.



Presently working as a Senior Research Fellow, working on development of extenders for improvement of post thaw motility of goat sperms. Primarily interested in Molecular work and gene expression studies.